

Radiation

Safety

Committee

Minutes of Sub-Committee review of November 23, 1999 -

A Switch for Ions to AtR and High Intensity Protons to g-2

Motivation: It was requested that the committee consider approving a method, which would allow the switching from high intensity proton beam to g-2 to ion beams to AtR (RHIC). Presently, the approved method is to RS LOTO the linac beam stops before the 8 and 20° bend in the U line have there RS LOTO removed.

The committee was presented with a proposed method to provide the equivalent protection with relay logic. The interlock logic will keep the linac beam stops closed if the power supply for the 8 or 20° bends in the U line are on. If the linac beam stops are open then the interlock logic will prevent the 8 and 20° bends from being turned on.

The committee approved the request.

A subgroup needs to approve the wiring for the proposed interlock. **(CK-ATR-1-00)**

An estimate of the maximum possible secondary beam, which can be transported past the 8° bend, must be provided. **(CK-ATR-2-00)**

There is concern about the secondary particle intensity which could be accepted into the U line downstream of the 8° bend and thereby compromise the effectiveness of the switch. The potential dose rate in the beam must be less than 50 rem/hr. The estimate should be done assuming the downstream transport has been optimized to accept secondary beam created in the bend. If too much potential secondary beam can be transported then it would be possible to compensate by including the requirement that VD3/4 is on and above minimum current as part of the 8° switch.

The fault studies need to be reviewed to see if the berm above the downstream U line meets the standards if there is a single fault enabling the 8° bend to transport high intensity protons to the 20° bend. If the downstream berm is secured then this is not necessary. **(CK-ATR-3-00)**

Some numbers were reviewed from fault study 25 which had a four-inch thick iron beam in the 24 GeV/c proton beam at the beginning of the 20° bend. Scaling the results of the fault study to 60TP with a 2.5 sec repetition rate suggests the chipmunk in UGE2 labyrinth would rise to 13 rem/hr, MNO84 on the berm would be 0.5 rem/hr, and the chipmunk in the W line (219) would be 1.4 rem/hr. The levels outside the UGE2 gate are lower than the chipmunk by about a factor of three due to the labyrinth.

The critical devices for the W line are the 8° and 20° bends. The w line can be occupied with this switch in use. The chipmunks in the UGE2 labyrinth and in the W line must be to protect personnel from this potential fault. A switch must be added such that the W line chipmunk is active when the high intensity protons are possible. The logic can bypass the W line chipmunk interlock if the W line is secured for beam. **(CK-ATR-4-00)**

There is the remote possibility that beam can be stored in the Booster or AGS rings for long periods of time allowing a single pulse to be extracted past the switch. This depends on the area and very unusual operating conditions. This could allow one pulse of high intensity beam to the W line dump. The pulse could not be transported to any ATR/RHIC areas, which could be occupied. Administrative steps have been added to procedures to remove this possibility for the ATR/RHIC. Since this can affect other areas the committee would like to see a hardware solution before FY2001 operations. **(CK-AGS/booster-2001-1)**